REMARKS

Claims 1-5, 7-8, 11-17, 18, 19-20, 21-24, and 25 are currently pending in the subject application, and are presently under consideration. Claims 1-5, 7-8, 11-17, 18, 19-20, 21-24, and 25 are rejected. Claims 1, 12, and 16 have been amended. New claims 26 and 27 have been added. Favorable reconsideration of the application is requested in view of the amendments and comments herein.

I. Objection to the Drawings

In the Office Action dated October 18, 2007 (hereinafter "Office Action"), Fig. 3 has been objected to for not showing legends explaining the reference numerals used in the figure in compliance with 37 CFR 1.84(o) (Office Action, page 2). FIG. 3 has been amended to add legends to the components depicted in FIG. 3. Accordingly, withdrawal of the objection to FIG. 3 is respectfully requested.

II. Rejection of Claims 7-11 under 35 U.S.C. §112

Claims 7-11 have been rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Specifically, the Examiner asserts that claim 7, as well as claims 8-11 based on their dependence from claim 7, "contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention," (Office Action, page 3). The Examiner further states the following:

> The disclosure does not teach any details on the tuning algorithm. For example, the specification states "FIG. 3 schematically illustrates an example hybrid circuit 300 that can be implemented in accordance with an aspect of the present invention. The hybrid circuit 300 comprises a biquad filter 302 in series with a high pass filter 304. This configuration provides two complex zeros, two complex poles, a zero at DC, and two real poles." However, the disclosure does not provide expressly the expressions for the two complex zeros, two complex poles, a zero at DC, and two real poles in terms of the biquad filter and the high pass filter components so that the filter components for tuning the hybrid circuit 300 may be adjusted. (Office Action, pages 3-4, emphasis in the original; citing Present Application, page 8, ll. 7-11).

Representative for Applicant respectfully disagrees with the rejection of claims 7-11 under 35 U.S.C. §112, first paragraph, for failing to comply with the written description requirement.

The requirement for written description, as set forth in the MPEP, states that, "[t]o satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention. See, *e.g.*, *Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1319, 66 USPQ2d 1429, 1438 (Fed. Cir. 2003); *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563, 19 USPQ2d 1111, 1116 (Fed. Cir. 1991)," (MPEP §2163).

The Court of Appeals of the Federal Circuit has decided that "[a]n applicant shows possession of the claimed invention by describing the claimed invention with all of its limitations using such descriptive means as words, structures, figures, diagrams, and formulas that fully set forth the claimed invention." *Lockwood v. American Airlines, Inc.,* 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997). The issue raised in the cases is most often phrased as whether the original application provides "adequate support" for the claims at issue (MPEP, §2163, emphasis in the original). Possession may also be shown by a clear depiction of the invention in detailed drawings or in structural chemical formulas which permit a person skilled in the art to clearly recognize that applicant had possession of the claimed invention. An adequate written description of the invention may be shown by any description of sufficient, relevant, identifying characteristics so long as a person skilled in the art would recognize that the inventor had possession of the claimed invention. See, *e.g.*, *Purdue Pharma L.P. v. Faulding Inc.*, 230 F.3d 1320, 1323, 56 USPQ2d 1481, 1483 (Fed. Cir. 2000). Therefore, a determination of whether claim 7 satisfies the written description requirement can be ascertained based on whether the Specification of the Present Application includes sufficient information such that one skilled in the art would recognize that the inventor had possession of the tuning algorithm.

Claim 7 recites tuning algorithm that selectively adjusts at least one variable passive component in the tunable filter to provide the tunable filter with a desired frequency response corresponding to loop characteristics of the associated communications network. Representative for Applicant respectfully submits that the Specification of the Present Application includes more than sufficient information to demonstrate that the inventor had possession of the tuning algorithm that is recited in claim 7. As one example, the Specification describes the following:

> The control 30 implements an algorithm to tune one or more passive circuit components of the tunable hybrid 12 so that the frequency response of the

> hybrid can substantially match the frequency response of the subscriber loop 16. The control can implement the algorithm to program (or tune) the hybrid 12 at power-up of the system 10, for example. Alternatively, the control 30 can be utilized offline (*e.g.*, by the manufacturer) based on the known or anticipated subscriber loop characteristics. (Present Application, page 4, line 30 through page 5, line 5).

As another example, the Specification describes the following:

> The system 50 can also include a decoder 62 connected to receive a control signal from a tuning algorithm 64. The decoder 62 provides a signal (*e.g.*, a control word) to the switch network 60 to set one or more associated switches within the switch network. By setting the switches, the tunable filter network 54 is set accordingly. In cases where there are multiple tunable components in the filter network 54, the decoder 62 can provide a separate word for each respective network. (Present Application, page 7, ll. 4-10).

Based on these passage, it can be ascertained that tuning the passive components of the hybrid can set the frequency response of the hybrid to match the frequency response of the subscriber loop, and that the tuning algorithm can be implemented to provide a coded control word that can be used to set switches in the tunable filter network, respectively. This latter teaching is summarized later in the Specification: "[t]he tuning algorithm can provide a control signal to decoder 62 that causes the switch network to adjust the capacitor network accordingly," (Present Application, page 7, ll. 24-25).

As another example, the Specification also describes more specific details regarding the function of the tuning algorithm:

> The tuning algorithm 64 is programmed and/or configured for selecting the desired values for of the variable capacitance network 58. For example, the tuning algorithm can provide a test input signal to emulate a transmitter output signal that is provided to drive the hybrid 52. The transmitter output signal is also provided to an interface of an associated communications network (*e.g.*, a subscriber loop), indicated schematically at 68. The hybrid provides a corresponding output signal having a frequency response that varies as a function of the capacitance switched in to the filter network 54 by the switch network 60. (Present Application, page 7, ll. 15-23).

This passage clearly states a manner in which the tuning algorithm can be implemented to adjust variable passive components to provide a desired frequency response, as recited in claim 7. In the following paragraph, the Specification provides even more detail about the implementation of the tuning algorithm: "[t]he tuning algorithm 64 can monitor the receiver signal and set the capacitor network 58 to a value that causes the output of the cancellation

network 66 to equal to or approach zero for a given test signal," (Present Application, page 7, line 29 through page 8, line 1). Additional support for how such tuning may be implemented can be found with reference to the methods of FIGS. 6 and 7 and the corresponding description in the Present Application.

It is thus demonstrated that the Present Application provides support of the tuning algorithm using descriptive means as words and figures that fully set forth the claimed invention, as required the Court of Appeals of the Federal Circuit. The Present Application also provides a clear depiction of the tuning algorithm in detailed drawings (*e.g.*, FIGS. 2, 6 and 7), such as to permit a person skilled in the art to clearly recognize that applicant had possession of the tuning algorithm that selectively adjusts at least one variable passive component in the tunable filter to provide the tunable filter with a desired frequency response corresponding to loop characteristics of the associated communications network, as recited in claim 7. Furthermore, it is clear that the function of the tuning algorithm, selective adjustment of at least one variable passive component in the tunable filter to provide the tunable filter with a desired frequency response corresponding to loop characteristics of the associated communications network, as recited in claim 7, is adequately supported by the Specification of the Present Application. As a result, it is clear that the Specification of the Present Application provides adequate written description of the tuning algorithm recited in claim 7.

Representative for Applicant also respectfully submits that the Examiner's statement that "the disclosure does not provide expressly the expressions for the two complex zeros, two complex poles, a zero at DC, and two real poles in terms of the biquad filter and the high pass filter components so that the filter components for tuning the hybrid circuit 300 may be adjusted," is not necessary to a determination of the satisfaction of the written description requirement regarding the tuning algorithm of claim 7. Claim 7 does not expressly recite anything with regard to poles and zeros, whether real or complex. Instead, the tuning algorithm "selectively adjusts at least one variable passive component in the tunable filter to provide the tunable filter with a desired frequency response corresponding to loop characteristics of the associated communications network," as recited in claim 7. The Present Application states the following with regard to the hybrid circuit 300:

> The tunable network within each path can have one or more variable impedance elements (*e.g.*, resistors, capacitors, inductors) for selecting the impedance of the path, and hence change the frequency response of the hybrid circuit 300.

> Similarly, amplifier 310 of high pass filter 304 can include feedback paths 320a and 320b implemented as tunable networks that may be employed to vary the response of the high pass filter 304. (Present Application, page 8, ll. 19-25)

The Present Application also states the following with regard to the hybrid circuit 300:

> According to an aspect of the present invention, the frequency response of the hybrid circuit 300 can be selectively adjusted to substantially match loop characteristics of an associated communications network in which the hybrid is implemented. By adjusting the frequency response of the hybrid circuit 300 according to loop characteristics (*e.g.*, by a controller (not shown)), upstream receiver performance can be improved over many existing hybrids (Present Application, page 9, ll. 3-8).

Therefore, as described by these passages in combination with the above recited passages, the tuning algorithm sets the variable impedance components to set the frequency response of the hybrid circuit 300. An express showing of expressions for the two complex zeros, two complex poles, a zero at DC, and two real poles in terms of the biquad filter and the high pass filter components unnecessary to demonstrate that the inventor had possession of the tuning algorithm that selectively adjusts at least one variable passive component in the tunable filter to provide the tunable filter with a desired frequency response corresponding to loop characteristics of the associated communications network, as recited in claim 7. There are also specific examples of tunable components (capacitors C1, C2, C3) that can be set to specific values to achieve certain frequency responses in relation to the example embodiment of FIG. 4.

For the reasons discussed above, Representative for Applicant respectfully submits that claim 7 satisfies the written description requirement of 35 U.S.C. §112, first paragraph. Accordingly, withdrawal of the rejection of claim 7, as well as claims 8-11 which depend therefrom, is respectfully requested.

III. Rejection of Claims 1-5, 7-8, 11-17, 19-20, and 25 under 35 U.S.C. §102(e)

Claims 1-5, 7-8, 11-17, 19-20, and 25 have been rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Publication No. 2003/0012364 to Lee ("Lee"). Claims 1, 8, 11, 12, and 16 have been amended. Claims 7 and 17 have been cancelled. Applicant traverses this rejection for the following reasons.

Claim 1 has been amended to recite a control system configured to selectively adjust at least one tunable component of the tunable filter to set at least one pole and at least one

zero of a transfer function of the tunable filter so that the transfer function of the tunable filter corresponds to loop characteristics of the associated communications network. Representative for Applicant respectfully submits that neither Lee nor any of the other cited reference teaches or suggests the combination of structural and functional features recited in claim 1. Withdrawal of the rejection of claim 1 as well as claims 2-5, 7-11, and 25 which depend therefrom, is respectfully requested.

Claim 11 has been amended to recite means for decoding a control signal provided by a control system to generate an output signal having one of a plurality of states, each of the plurality of states corresponding to predetermined loop impedance and line coupling characteristics for a respective associated communications network, and that the means for selectively tuning the separating means is based on the one of the plurality of states of the output signal to set at least one of at least one pole and at least one zero of the means for separating. Representative for Applicant respectfully submits that neither Lee nor any of the other cited art teaches or suggests the combination of structural and functional elements of amended claim 11. Withdrawal of the rejection of claim 11 as well as claims 12-15 which depend therefrom, is respectfully requested.

Claim 16 has been amended to recite decoding a control signal to provide a decoder output having a value corresponding to one of a plurality of impedance characteristics that substantially matches predetermined loop impedance characteristics of an associated subscriber loop, and that selectively adjusting at least one of at least one pole and at least one zero of a transfer function of a tunable filter of a hybrid is based on the output signal to set the frequency response. Representative for Applicant respectfully submits that neither Lee nor any of the other cited art teaches or suggests these elements of claim 16. Withdrawal of the rejection of claim 16 as well as claims 17-24 which depend therefrom, is respectfully requested.

IV. Rejection of Claims 9 and 10 under 35 U.S.C. §103(a)

Claims 9 and 10 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Lee in view of U.S. Patent No. 6,445,7891 to Grisamore, et al. ("Grisamore"). Applicant traverses this rejection for the following reasons.

Claims 9 and 10 depend from claim 1. As described above, neither Lee nor any of the other cited art teaches or suggests amended claim 1, from which claims 9 and 10 depend. The addition of Grisamore does not cure the deficiencies of Lee or any of the other cited art

to teach or suggest claim 1. Therefore, claims 9 and 10 should be allowed over the cited art. Withdrawal of the rejection of claims 9 and 10 is respectfully requested.

V. Rejection of Claims 18 and 21-24 under 35 U.S.C. §103(a)

Claims 18 and 21-24 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Lee in view of U.S. Patent No. 6,751,202 to Henrie, et al. ("Henrie"). Applicant traverses this rejection for the following reasons.

Claims 18 and 21-24 depend from claim 16. As described above, neither Lee nor any of the other cited art teaches or suggests amended claim 16, from which claims 18 and 21-24 depend. The addition of Henrie does not cure the deficiencies of Lee or any of the other cited art to teach or suggest claim 16. Therefore, claims 18 and 21-24 should be allowed over the cited art. Withdrawal of the rejection of claims 18 and 21-24 is respectfully requested.

VI. New Claims 26 and 27

New claim 26 depends from claim 10 and recites that the output signal has a value corresponding to one of a plurality of different predetermined loop characteristics of respective communications networks, the switch network setting the desired impedance for the at least one variable passive component based on the output signal so that the frequency response of the tunable network substantially matches the loop characteristics of the associated communications network. Representative for Applicant respectfully submits that none of the cited art teaches or suggests new claim 26. Consideration and allowance of new claim 26 is respectfully requested.

New claim 27 depends from claim 5 and recites a biquad filter comprising a first amplifier and a second amplifier connected in series with the first amplifier, the first amplifier having at least one feedback path that comprises at least one first variable passive component, a feedforward path coupled between the first amplifier and the second amplifier that comprises at least one second variable passive component. New claim 27 also recites that the control system is configured to selectively adjust the at least one first variable passive component and the at least one second variable passive component so that the frequency response of the tunable network substantially matches the loop characteristics of the associated communications network. Representative for Applicant respectfully submits that none of the cited art teaches or suggests new claim 27. Consideration and allowance of new claim 27 is respectfully requested.

VII. CONCLUSION

In view of the foregoing remarks, Applicant respectfully submits that the present application is in condition for allowance. Applicant respectfully requests reconsideration of this application and that the application be passed to issue.

Should the Examiner have any questions concerning this paper, the Examiner is invited and encouraged to contact Applicant's undersigned attorney at (216) 621-2234, Ext. 106.

Fees for the Request for Continued Examination are being charged to Assignee's Deposit Account on the transmittal paper submitted herewith. No additional fees should be due for this response and new claims in view of the cancellation of other claims. In the event any fees are due in connection with the filing of this document, the Commissioner is authorized to charge those fees to Deposit Account No. 20-0668 of Texas Instruments Incorporated.

I hereby certify that this correspondence is being transmitted to the U.S. Patent and Trademark Office via electronic filing on January 18, 2008.

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